The emergence of a mega-port: from the global to the local, the case of Busan

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THE EMERGENCE OF A MEGA-PORT- FROM THE GLOBAL TO THE LOCAL, THE CASE OF BUSAN*

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ABSTRACT

Busan port was ranked third place of the world container ports in 2001. This port growth was implemented within a major urban settlement of over 4 million inhabitants. It could be explained by the insertion of the port city in the maritime networks of the world leading ocean carriers. The coexistence of port and urban functions in the same area could lead to asphyxia. The efficient articulation of reticular and territorial logics, in different scales, from the global to the local and conversely, is a necessity to improve the development of the port city.

Keywords: South Korea, East Asia, containerization, port, port city.

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1. INTRODUCTION

The maritime façade between Japan and Singapore has become the key focus of world container shipping over to the last two decades. The scale of the developments and the rapidity of growth have been remarkable. While the Japanese ports of Tokyo, Yokohama, Kobe and Nagoya have been among the largest container ports in the world ever since the inception of containerization in the 1960s, they have been overshadowed by the emergence during the 1980s of Hong Kong and Singapore and Kaohsiung (Rimmer, 1999). These Asian 'Tigers' have been ranked consistently among the top five ports in the world. During the 1990s two other Asian ports, Shanghai and Busan, have been catapulted into global prominence, and in 2003 occupied third and fourth ranked positions worldwide.

Inevitably, Singapore and Hong Kong have drawn the largest share of academic interest. Singapore is exceptional because of its hub function and dominance of South East Asian regional markets. Its port authority is now a major player in port operations and management of a growing number of ports around the world. More recently, competition from new ports in Malaysia has appeared which has demonstrated the limits to port concentration (Slack and Wang, 2002). Hong Kong's role as the gateway to China, its changing role with the emergence of new ports in the Pearl River Delta (Wang, 1998, Song, 2002), and its unusual governance relationships have given rise to a new understanding of regional port complexes (Wang and Slack, 2004). Some of the concepts relating to regional port development and governance have also been applied to Shanghai, whose recent growth also demonstrates how the existence of an enormous local market can negate physical constraints of a shallow natural harbour (Wang and Olivier, 2004). Kaohsiung has been shown to exhibit some of these traits: serving a strong export-based domestic economy but whose site is contested by other port uses (Haynes and al, 1998).

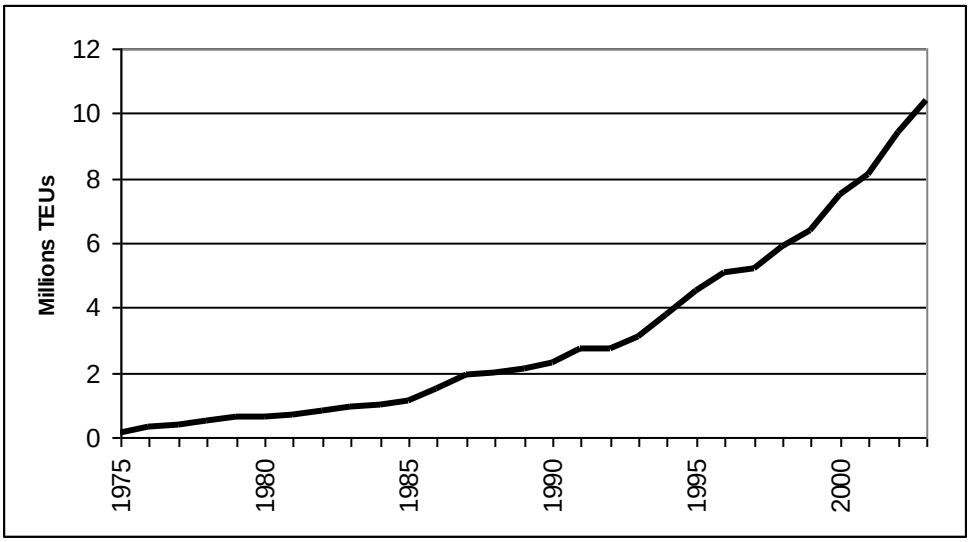
From these examples several themes of Asian container port development are emerging. First, it is the role of transshipment in achieving mega-port status, with only Shanghai standing apart. Second, it is the issue of regional port competition and the "challenge of peripheral ports" (Hayuth, 1981). Third, it is the role of the private sector in port/terminal management. With the exception of the issue of port capacity (Cullinane and Song, 1998), western academic literature has largely ignored Busan, despite its rapid growth and global importance (Frémont and Ducruet, 2004). This paper attempts to address this imbalance by examining the extent to which the Korean port fits the 'Asian model' and what is distinctive about the trajectory of its growth. It is shown that there are a surprising number of commonalities between Busan and the other mega-ports, despite some obvious differences based on unique environmental and political conditions.

2. THE GROWTH OF BUSAN

Busan port was ranked the fourth largest container port in the world in 2003, handling 10.4 million Twenty-Foot Equivalent Units (TEUs) in 2002. Its first container terminal did not open until 1975, but since then its traffic has doubled every five or six years on average (Fig.1).

This growth is related in part to the rise of South Korea as a global trading nation. In 1970, South Korea accounted for only 0.7% of global trade by value, but by 2003 the country accounted for 2.5%, and 50% of its manufacturing jobs are related to exports (Cullinane, op. cit.). Approximately 83% of the country's exports are containerized (Soo, 1990). This export-based growth of South Korea mirrors that of other newly industrializing countries (NICs) of South-East Asia: China, Hong Kong, Singapore and Taiwan.

Figure 1. Container throughput in Busan (1975-2003).



Source: Containerization International Yearbooks.

The rise of foreign trade generated a corresponding growth in port traffic. Confined to the north by North Korea's locked frontier since 1953, South Korea is essentially an island: more than 99% of its foreign trade is shipped by sea (Cullinane, op. cit.). Raw materials are mainly carried through the ports of Pohang close to the POSCO iron and steel industrial complex; Ulsan for petroleum and Inchon, which is the closest port to Seoul. Busan is the country's container and general cargo port and until the recent development of Gwangyang, Busan handled more than 90% of Korea's container traffic. It serves a national hinterland, since its own urban area and neighbouring provinces generate a minority of South Korea's container traffic, the largest market being Seoul, 400km away. Despite the proximity of Inchon to Seoul, its role in container traffic is negligible (7% of national container throughput) because of a very high tidal range and a lock gate system that is not well adapted to accommodate giant containerships. Busan, on the other hand offers excellent nautical conditions. The port site forms a wide bay providing deep water (-15 meters), that is well protected from tidal surges and subject to a very low tidal range. In this

regard, Busan is very similar to Kaohsiung, since it too is distant from Taiwan's main industrial area for containerized exports, the capital Taipei (Haynes et al, 1998), only that there the local ports are limited by shallow water rather than a high tidal range.

Table 1. Container throughputs of East Asian ports (1995-2003).

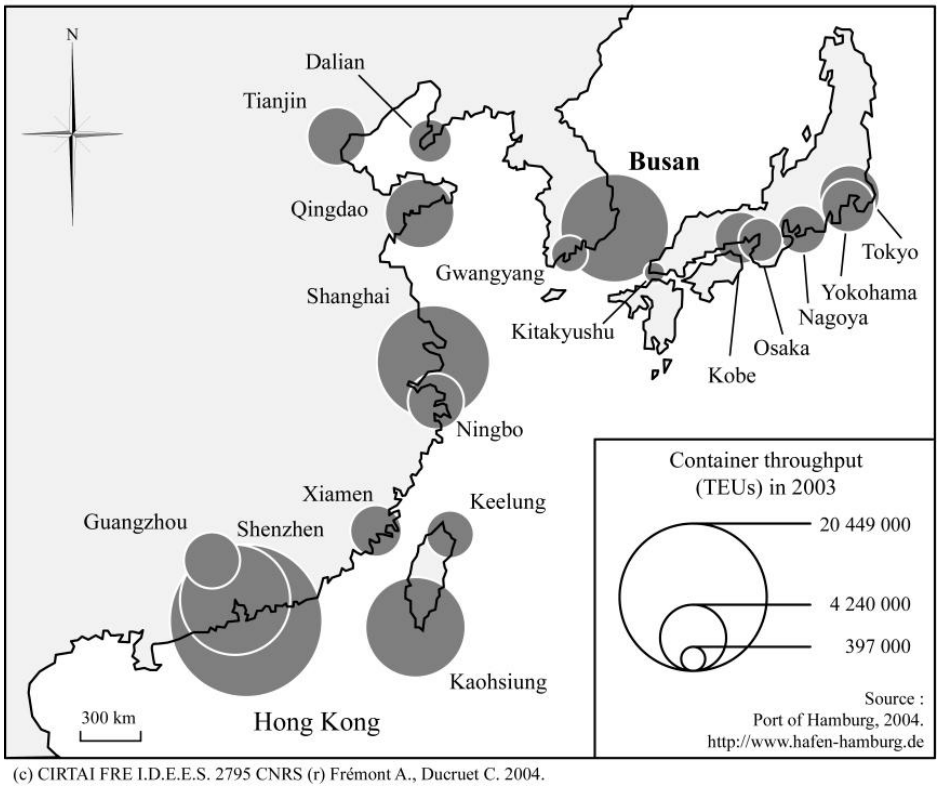
1995				2001				2003			
		TEU	%			TEU	%			TEU	%
1	Hong Kong	12,5	20,8	1	Hong Kong	17,9	17,1	1	Hong Kong	20,4	15,7
2	Singapore	11,8	19,6	2	Singapore	15,5	14,8	2	Singapore	18,4	14,2
3	Kaohsiung	5,2	8,7	3	Busan	8,1	7,7	3	Shanghai	11,2	8,7
4	Busan	4,5	7,5	4	Kaohsiung	7,5	7,2	4	Busan	10,4	8,0
5	Yokohama	2,8	4,6	5	Shanghai	6,3	6,0	5	Kaohsiung	8,8	6,8
6	Tokyo	2,2	3,6	6	Port Klang	3,7	3,6	6	Yantian	5,2	4,0
7	Keelung	2,2	3,6	7	Yantian	2,7	2,6	7	Port Klang	4,8	3,7
8	Manila	1,7	2,8	8	Qingdao	2,6	2,5	8	Qingdao	4,2	3,3
9	Shanghai	1,5	2,5	9	Tokyo	2,5	2,4	9	Tanjung Pelepas	3,5	2,7
10	Nagoya	1,5	2,4	10	Laem Chabang	2,3	2,2	10	Tokyo	3,3	2,5
Subtotal		45,9	76,0	Subtotal		69,3	66,1	Subtotal		90,5	69,6
Other		14,5	24,0	Other		35,6	33,9	Other		39,6	30,4
TOTAL		60,4	100	TOTAL		104,9	100	TOTAL		130,1	100,0

Source: Containerization International Yearbooks.

National container traffic alone does not explain Busan's pre-eminence. A particularly important spatial advantage is its intermediacy (Hayuth and Fleming, 1994). The main North-South shipping lane running from Japan to Singapore through Hong Kong passes close to Busan, and it is on the great circle route across the Pacific. Thus, from the 1990s, Busan has added a transshipment function to its already major role as a hinterland port. Accounting for less than 5% of the overall traffic movement in 1989, transshipment volumes grew to 15% in 1994, 25% in 1999 and 40.8% in 2003 (Containerization International, 1995, 2000, 2004a). It is this rapid growth of transshipment traffic that has allowed Busan to sustain its present market share of nearly eight per cent of East Asian ports traffic. This has occurred when other hubs in East, North East and South East Asia have experienced some declines in their market shares because of

regional competition. Thus, between 1995 and 2003 Hong Kong's share fell from 20.8% to 15.7%, Kaohsiung from 8.6% to 6.8%, and Singapore from 19.6% to 14.2% (Tab.1 and Fig.2).

Figure 2. Container throughputs of East Asian ports in 2003.



Source: Port of Hamburg.

Busan's emergence as a container port for both hinterland and transshipment traffic is mirrored by the expansion in services offered by the global shipping lines that have made the port a hub for their services in North East Asia. Twenty six of the top twenty seven global carriers were present in Busan in 2002 (Tab.2). However, weekly transport capacity (WTC), as determined by totalling the slots available by weekly sailings from the port, is dominated by the two Korean companies Hanjin and Hyundai who account for 31% of the port total. This strong Korean presence in Busan is historical and political. Hanjin and Hyundai have played an important role

in supporting the foreign trade of their home country in the same way that Evergreen has for Taiwan, NOL for Singapore, OOCL for Hong Kong and COSCO for Shanghai.

Table 2. Shipping companies' market shares for Busan port in 2002.

Shipping Companies	Nationality	TEUs	%
Hyundai	South Korea	35 156	14.0
Hanjin	South Korea	34 684	13.8
CMA-CGM	France	15 184	6.0
PONL	UK / Netherlands	15 133	6.0
Maersk	Denmark	14 838	5.9
MSC	Italy / Switzerland	14 755	5.9
CSCL	China	13 813	5.5
Senator	South Korea	13 421	5.3
NYK	Japan	11 217	4.5
APL	Singapore	11 212	4.4
OOCL	Hong Kong	9 574	3.8
ZIM	Israël	8 949	3.6
Yangming	Taïwan	8 802	3.5
Cosco	China	8 252	3.3
Evergreen	Taïwan	7 837	3.1
K Line	Japan	5 325	2.1
Mitsui OSK Line	Japan	4 691	1.9
Lloyd Triestino	Taïwan	4 122	1.6
CSAV	Chile	3 926	1.6
UASC	Koweït	3 802	1.5
Wan Hai	Taiwan	2 135	0.8
PIL	Singapore	1 952	0.8
MISC	Malaysia	1 689	0.7
Safmarine	Denmark	1 001	0.4
Hapag-Lloyd	Germany	538	0.2
Delmas	France	-	0.0
Total		**252 008**	**100.0**
Of which alliances		**86 573**	**34.4**
Coscon/K-Line/ Yangming Alliance		2 613	1.0
Grand Alliance		25 776	10.2
New World Alliance		30 997	12.3
United Alliance		27 187	10.8

Source: Weekly Containerized Transport Capacity Database, Le Havre, C.I.R.T.A.I.

However, European and other Asian shipping lines have a strong presence in Busan. Their share of the total WTC is 28% and 36% respectively. The presence of the major non-Korean shipping companies indicates that Busan's port activity today is no longer rooted only in Korean foreign trade. Because it is located on the main Asian shipping lanes, Busan has become a port where some carriers have decided to establish a hub, from which containers are feedered to regional ports. These trends are reflected by the high concentration of WTC offered in Busan by several shipping lines as a proportion of their own Asian port networks (Tab.3). As national carriers it is not surprising that Hyundai and Hanjin with its DSR Senator branch each offer more than 17% of their WTC to Busan. The rate is also very high for MSC (11.3%), CMA-CGM (9.6%), China Shipping Container Lines (10.1%) and ZIM (14.4%).

It may be observed that there appears to be a systematic relationship that when Busan's share is proportionately high, the Japanese ports' share and to a certain extent that of Kaohsiung, are lower. This is particularly true for CMA-CGM and China Container Lines which are not present in Kaohsiung nor in Japanese ports. In contrast, shipping lines which concentrate their WTC in Japanese ports or in Kaohsiung are relatively weaker in Busan. Japanese carriers are disproportionately concentrating their capacity in Japanese ports, with K-Line allocating 24.2% of its WTC to Japanese ports but only 2% to Busan, NYK Line 30.5% against 6.2%, and MOL 40.2% against 4.3%. This is the same for the Taiwanese shipping lines Yangming, Evergreen and its Lloyds Triestino subsidiary. They are concentrated in Kaohsiung as well as in Japanese ports, but almost absent in Busan. This pattern is also true for Maersk-Sealand, APL and Hapag-Lloyd, but the distinction is less for P&O Nedlloyd and Orient Overseas Container Line (OOCL).

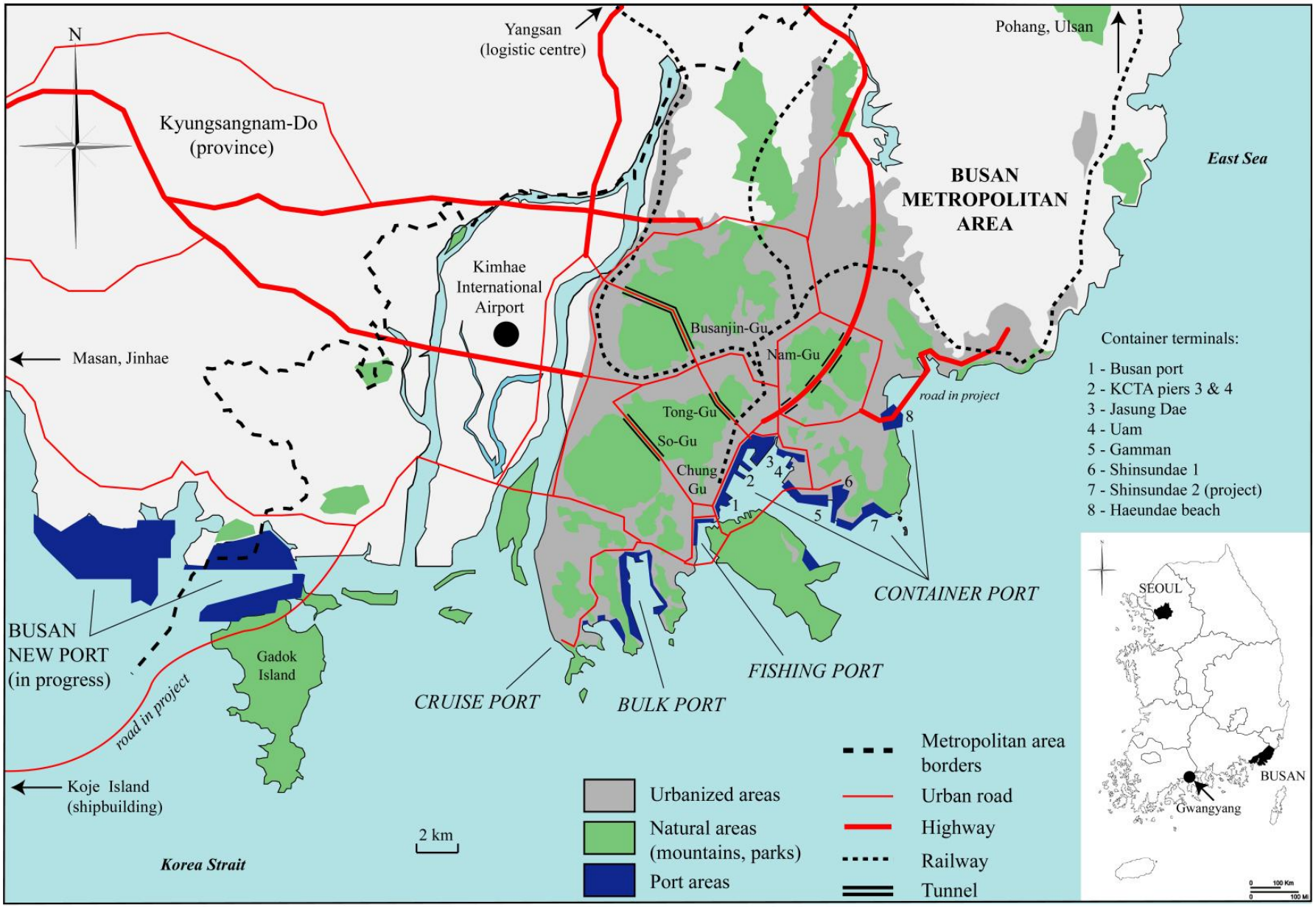
This regional differentiation of service capacity allocation is mirrored in the WTCs of the major global alliances. The presence of the three Korean shipping companies, Hanjin, Yangming and Senator, within the United Alliance results in the relatively high capacity share of Busan (16.7%).

Table 3. Weekly Containerized Transport Capacity (WCTC) shares among Busan and north-east Asian ports for the world's major 26 shipping companies.

	Hong Kong	Singapore	Kaohsiung	Busan	Shanghai	Kobe	Yokohama	Tokyo	Nagoya	Osaka	Gwangyang	Others	Total (EVP)	Of which Japanese ports
Grand Alliance	19.8	18.2	10.6	6.1	5.0	5.0	2.2	2.8	4.5	0.0	0.0	25.8	1 035 802	14.5
New World Alliance	17.0	9.7	10.9	6.8	3.5	9.1	5.8	8.5	7.2	0.0	3.4	18.1	453 224	30.6
United Alliance	15.1	12.9	8.7	16.7	5.3	0.0	0.0	5.7	0.0	4.2	4.8	26.5	262 975	10.0
Maersk-Sealand	18.0	4.7	9.2	4.4	3.1	7.9	9.5	0.5	4.4	1.2	3.2	33.7	373 339	23.6
P&O Nedlloyd	18.8	20.0	8.2	7.2	5.4	4.0	2.0	2.5	4.0	0.0	0.0	27.8	486 588	12.6
MSC	17.7	12.7	2.3	11.3	6.5	0.0	2.3	2.5	2.3	2.3	0.0	40.3	151 115	9.3
Cosco	15.4	10.6	0.0	3.0	10.9	3.1	7.1	1.0	1.5	1.0	0.0	46.5	274 699	13.7
APL	13.6	14.8	9.8	3.9	4.5	7.2	6.1	4.5	3.3	0.0	1.1	31.2	308 783	21.1
Evergreen	15.7	11.8	14.6	2.6	1.1	0.9	1.8	7.7	2.6	7.2	0.3	33.7	361 307	20.3
Hanjin	12.7	10.5	8.4	17.6	4.0	1.5	2.5	7.4	1.1	5.5	2.9	25.8	275 198	18.0
K Line	15.7	14.0	3.5	2.0	5.7	6.8	2.7	6.4	7.0	1.3	0.0	34.9	356 112	24.2
CMA-CGM	20.5	9.5	0.0	9.6	8.6	0.0	0.0	0.0	0.0	0.0	2.6	49.1	159 226	0.0
NYK	11.0	14.5	2.2	6.2	5.8	8.9	4.4	6.3	9.4	1.5	0.0	29.9	342 877	30.5
OOCL	22.3	14.8	14.8	4.0	2.3	2.6	1.1	2.6	1.6	1.1	0.0	32.9	363 095	9.0
China Shipping	16.7	1.8	0.0	10.1	6.6	0.2	4.1	0.0	0.0	0.2	0.2	60.0	137 393	4.5
Mitsui OSK Line	17.6	16.1	1.9	4.3	2.4	11.5	5.5	11.4	10.5	1.3	0.0	17.5	213 031	40.2
Hyundai	18.1	9.7	10.9	16.8	2.7	0.5	2.7	2.7	2.2	0.5	6.6	26.6	214 248	8.7
Hapag-Lloyd	21.4	18.5	9.1	2.2	6.4	6.8	4.5	2.3	4.5	0.0	0.0	24.3	206 948	18.2
ZIM	23.4	0.0	4.5	14.4	13.3	0.0	5.6	0.0	0.0	5.6	0.0	33.3	62 280	11.2
Yangming	19.8	11.1	10.3	2.8	5.0	5.0	3.2	3.7	2.6	0.8	0.6	35.0	311 475	15.4
Senator	18.2	12.5	14.7	21.9	3.5	0.0	0.0	0.0	0.0	0.0	5.5	23.7	81 959	0.0
Lloyd Triestino	19.9	8.7	13.6	4.6	11.7	0.0	0.0	0.0	2.3	0.0	0.0	39.1	88 909	2.3
Wan Hai	17.8	9.0	6.7	1.6	1.9	3.7	3.8	3.8	2.5	3.0	0.8	45.5	193 490	16.7
PIL	14.8	22.3	1.4	1.3	4.5	0.0	0.0	0.0	0.0	0.0	0.0	55.8	154 875	0.0
UASC	25.0	25.0	12.5	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	30 416	0.0
Delmas	0.0	42.6	0.0	0.0	14.8	0.0	0.0	0.0	0.0	0.0	0.0	42.6	6 453	0.0
Safmarine	22.2	11.1	0.0	11.1	11.1	0.0	0.0	0.0	0.0	0.0	0.0	44.4	24 621	0.0
CSAV	19.5	14.7	0.0	12.2	4.8	4.8	12.2	0.0	12.2	0.0	0.0	19.5	37 593	29.2
MISC	12.1	24.5	0.0	5.3	6.3	4.5	4.5	0.0	3.5	1.0	0.0	38.5	121 392	13.4

Source: Weekly Containerized Transport Capacity Database, Le Havre, C.I.R.T.A.I. ©

Figure 3. The port city of Busan



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On the other hand, the New World Alliance dominated by APL and MOL, allocates 30% of its WTC to Japanese ports. For the Grand Alliance, the difference between Japanese ports and Busan is relatively small (14.5% to 6.1%) even though this alliance includes NYK and no Korean lines.

The analysis suggests that Busan is in direct competition with Japanese ports in being selected as a hub location by global shipping companies. For several of the carriers the choice of Busan has been made because of disadvantages of Japan. The latter's port costs are very high: Terminal Handling Charges (THC) set by the Far Eastern Freight Conference for a twenty foot container are $235 in Kobe but only $80 in Busan (Containerization International, 2002a). Many carriers are deterred from calling at Japanese ports because of the unions, the high level of bureaucracy and the lack of openness to foreign businesses. Finally, the scattering of five ports over 500 kilometres makes it difficult for the shipping companies to concentrate their services at one of the 5 ports and to take full advantage a hub network. Only MOL concentrates more than 10% of its Asian WTC in one Japanese port, while nine companies have higher proportions in Busan. A further factor was the 1995 Kobe's earthquake which forced shipping lines to find alternative solutions, and many redirected their vessels to Busan. Even after reconstruction, companies that had strong historical ties with Japanese ports for transshipment retained a substantial part of their activity in Busan.[3]

Busan not only captured traffic from Japan but from Northern China as well. In 2000, Busan's transshipment activity from both Japan and China increased by more than 45% (D.R.E.E., 2001). The exponential growth of Chinese traffic is a major factor accounting for the growth of transshipment trade in Busan. Yellow Sea ports such as Qingdao, Tianjin, Dalian, situated well away from the global maritime shipping lanes, are directly linked to Busan, which then

[3] Our study on the shipping companies' transport capacity is available only for 2002. Research is now in progress for the year 1993 so as to measure a 10 year evolution.

distributes this Chinese trade to North America and Europe. It is also in these northern Chinese provinces that direct Korean investments are the most considerable (Jie et al, 2000). Busan has also benefited from the enormous growth of trade from Shanghai, where, because of depth of water limitations, ships depart partially loaded to be topped off at Busan.

3. CHALLENGES

3.1 Local congestion, regional imbalances and international competition

Despite the formidable success of Busan, its future is threatened by a number of pressures at a variety of spatial scales. The port is contiguous to a major urban settlement, and the continuous increase in container flows within this highly urbanized site is threatening both port and city with asphyxia. The regional economy is not conducive to the establishment of many of the service activities that are necessary in a modern port cluster. At the same time the growth of direct shipments from North Chinese ports is a threat to Busan's transshipment trade.

The coexistence of port and urban functions: an impossible relationship?

Today, Busan's entire bay is dedicated to the port activity. To cope with the growth of traffic, the Korean authorities have built new terminals, and all are fairly young, from the oldest Jasung Dae Container Terminal, built in 1978, to the most recent Shin Gamman Terminal built in 2002.

If Busan bay is an excellent natural harbour, the port site is quite constrained. Container berths have to share port space with other activities. As a result Busan's container terminals suffer from heavy congestion: "Terminals are so busy that vessels are not allowed to discharge their cargoes, so a large portion of containers subsequently have to be handled at conventional piers. In 2000, these conventional piers handled a massive 2.36 million TEU" (Kim, 2002). This congestion has

been recognized in a number of Korean reports, some of which blame the lack of port investment in Korea.

The problem of inland congestion is much more severe. 85% of containers are transported by road. Located almost in the city centre, the container terminals are not well connected to each other (Fig.3). Thus port traffic mixes with general urban traffic causing significant problems over the whole urban area. The proximity of mountains to the container terminals aggravates the problem of road access. Some urban highways reach the terminals by large tunnels through the surrounding mountains, for example, the Jasung Dae Container terminal.

Port traffic is dispersed all over the urbanized area because 37 off-dock container yards are scattered around the city. In 2000, they handled 3.1 million import/export containers (Containerization International, op. cit.). The trucks severely damage city roads (Anonymous, 1991). Port generated truck traffic is adding to a growing problem of urban congestion, strongly driven by growth in car ownership and improved living standards. Today, Busan is facing total gridlock. This is being reflected in delays in serving the main domestic market, Seoul. Even in 1994, a journey by road between Busan and Seoul took 14 hours compared to 8 hours in 1980 (Containerization International, 1994), despite numerous improvements in road infrastructures. This traffic congestion impacts on the smooth running of the whole port node itself.

Despite the severity of the problem, concerted planning policy between city and port is non-existent. The institutional system is not well structured to develop appropriate policy responses. Port policy depends directly on central government though the Ministry of Maritime Affairs and Fisheries (MOMAF) and the Korea Container Terminal Authority (KCTA), the latter planning buildings and new terminals. Within Busan's City Hall, the "Port Policy Department" works directly with MOMAF and KCTA with the aim of strengthening the port function but totally ignoring the "Urban Planning Department", even though it is located in the same building and

promotes the development of an attractive waterfront (Cho et al, 2002). With such a difficult geographical site, contradictory projects are sometimes conceived for the same areas. For example, the project to shift of some of the port transshipment activity to the vicinity of the city railway station was opposed by the city, who proposed residential development of the areas (Park, 1990).

The saturation has been such that a container tax was introduced, allowing the city to raise revenue from container traffic while at the same time trying to limit this traffic (Kim et al, 2002). However, the efficiency of this tax is hotly debated and its imposition seemingly contradicts port development objectives. Initiatives such as this, along with the effects of local congestion may cause intermodal transport players to relocate their activities elsewhere. This explains why this tax has been abandoned in 2003, in order to avoid any loosening of competitivity.

Finally, recent events have affected the efficiency both perceived and real of the port of Busan. In 2003 there were two national strikes of truckers that interrupted regular shipments of containers to and from domestic hinterland markets. In addition, the port was severely impacted by typhoon Maemi in September 2003 which disabled 12 of the ports 52 gantry cranes. While the port authority was able to adjust very quickly to these calamities, they had occurred at a time when the existing structural difficulties were already causing concern among some shipping lines.

These local difficulties are certainly not absent in many of the competing East Asian hubs. Kaohsiung, for example, experiences similar difficulties of container terminals sharing the same space with other port activities (Haynes et al, op. cit.). Furthermore, the issues of port access and urban congestion are present in most other metropolitan port centres, such as Hong Kong and Shanghai. Rather it is the scale and scope of these problems that makes Busan stand out. Its urban and physical setting is presenting formidable challenges for its continued success as a container port.

The difficulties of becoming a maritime metropolis: the dependence on Seoul

The threats of asphyxia for Busan port are accentuated by the city's incapacity to develop commercial and logistics functions appropriate for a large maritime metropolis. A major problem is Busan's dependence on the capital, Seoul.

With almost 4 million inhabitants in 2002, almost 10% of the Korean population, Busan is a large metropolis, but it is dwarfed by Seoul, which has 10 million inhabitants in the inner city alone. Seoul is the political and commercial capital of the country, and dominates the entire urban hierarchy.

Busan developed after the Korean War as an industrial centre. Relatively low added value industries such as textiles were established as well as chemicals and machinery, requiring an abundant and frequently low qualified workforce that gave rise to a mass rural exodus (Shin, 1998). This resulted in new infrastructures, an impressive expansion of the city and creation of a local consumer market.

Busan has remained an industrial port city (Park et al, 2000). In 1995, Busan accounted for 71.2% and 48% of the region's industrial firms and manufacturing jobs respectively (Lim, 2000). However, the city has begun to suffer competition from new Asian competitors. Korean factories are being relocated to Vietnam and China, dealing a severe blow to Busan's traditional economic prosperity. It has difficulty in diversifying because of the dominance of the capital city. In 1995, Seoul contained 24% of the national population but 61% of employees in finance and marketing, and 96% of the headquarters of major companies (Hong, 1996) including Hyundai and Hanjin.

3.2 Competition from China

Part of Busan's success is its role as a transshipment port for the burgeoning traffic exports of North China. Because Chinese ports were poorly equipped and had significant physical constraints, international shipping lines were reluctant to establish direct services there.

Table 4. Throughputs and growth of Busan and northern Chinese ports (1995-2003).

	1995		2003		Average annual growth 1995/2003
	TEUs	%	TEUs	%	
Shanghai	1,5	19,0	11,3	51,1	28,7
Busan	**4,5**	**57,0**	**10,4**	**47,1**	11,0
Qingdao	0,6	7,6	4,2	19,0	27,5
Xingang/Tianjin	0,7	8,9	3,0	13,6	19,9
Ningbo	0,2	2,5	2,8	12,7	39,0
Dalian	0,4	5,1	1,7	7,7	19,8
Total	7,9	100,0	22,1	100,0	

Source: Port of Hamburg.

As discussed above, Busan's geographical intermediacy (Hayuth and Fleming, op. cit.), and efficiency resulted in it capturing a significant proportion of the China trade, with transshipments accounting for over 40% of traffic in 2003. This type of function is highly competitive and potentially unstable. Changes in conditions can bring about significant alterations. Over the last five years Chinese authorities have sought to provide improved capacity in its major ports in order to attract direct services. Chinese ports' throughput has been recording an exceptional growth during ten years (Tab.4). Mega port expansion projects are underway in all the major Chinese ports, particularly in Shanghai, Qingdao, Tianjin, Ningbo and Dalian. These projects involve not only the provision of international-standard container berths, but also the participation of foreign capital in the management and eventual operation of the new terminals.

These projects are being rapidly carried out, and already many of the major international shipping lines have established direct container services with these ports. This represents a serious threat to an important part of Busan's traffic activity. The threat is likely to get much more intense when the new terminals in Shanghai (Yanshan) begin to come on stream in 2005, and Qingdao completes the transfer of its container activity to the new port in 2006.

3.3 Government Responses

The Korean ports industry has always been dependent upon government action (Cullinane and Song, op. cit.). The Ministry of Maritime Affairs and Fisheries (MOMAF) exerts control over the provision of marine infrastructures. It decides when and where facilities are to be built. The management of the terminals is devolved to the Korea Terminal Authority (KCTA), which receives the terminals at no cost. This has been a highly centralized system therefore. The system worked as long as no unforeseen challenges were encountered.

While the system provided Korea with a competitive port system initially, traffic expansion at Busan during the 1990s outgrew the facilities that had been constructed. One of the reasons for congestion at Busan was the slowness of MOMAF to respond to the growing demand for new facilities (Cullinane and Song, op. cit.). By the mid 1990s it was becoming apparent that if Korea as a whole was to adjust to the growth of China, significant changes would have to take place, requiring the provision of new transport capacity, including new port facilities and a new airport at Inchon. The financial crisis of 1997 accentuated the need for change not only in capacity but also new governance procedures and for a focus on the expansion of logistics functions.

New infrastructures

In 1995 the heavy industrial city of Gwangyang (iron & steel and petrochemicals) was chosen by MOMAF to become a new container port to help overcome congestion at Busan. This decision resulted in the construction of four new berths that were opened in 1998 and 1999. With good marine accessibility, with a 20 meter water depth, and no large adjacent urban area Gwangyang is a good site for a modern port development. Its local hinterland is limited, but because it possesses good accessibility inland, time and costs to Seoul are lower than Busan. Journey times from Gwangyang to the Masan logistic centre are the same as those from Busan terminals, despite the distance being four times longer. In terms of costs, Korean authorities have guaranteed some financial advantages to shippers as well as to shipping companies operating through Gwangyang. Finally, the presence of the two main Korean shipping companies Hanjin and Hyundai in the first terminals gave Gwangyang an early boost in traffic that it has maintained, reaching 1.2 million TEUs in 2003.

More recently, decisions were made to construct a new container complex 10 km to the west of Busan Bay, close to the Noksam industrial complex. This new port will be located totally outside the urban agglomeration; it quits the original bay site (Fig.3). The New Busan Port is under construction on a large site reclaimed from the sea and Gadok Island. The project will eventually have 24 new berths posts with an annual handling capacity of 4.6 million TEUs. The first five berths will be delivered in 2006. The new facility is intended not only to add handling capacity to Busan, but also provide relief from the present urban congestion afflicting the present port facilities. This is regarded as essential in retaining multimodal operators in Busan itself.

The port of Inchon is not cut from such investments: a new container terminal operated by Port of Singapore Authority (PSA), in a joint-venture with Samsung, was inaugurated in July 2004. Its yearly capacity is of 400.000 TEUs with, if the construction of two other 300m quays is decided by the Korean government, a potential of 1.2 million TEUs per annum around 2011, which would

be added to a total of 820.000 TEUs in 2003. This terminal wouldn't suffer from the handicaps of former infrastructures operated by Hanjin and Korea Express. Its water depth is of 14 metres and is accessible without lock gate. Such an investment is directly focused on catching regional flows, notably those between Yellow Sea's Chinese ports and South Korea. This would avoid the shippers of Greater Seoul to be dependant from Busan or Gwangyang, when at the same time the Kyongin Canal is under way (2011) to reduce trucking between Inchon and Seoul (Ducruet, 2005). Transshipment throughputs, which would compete with regional flows, are still not planned (Containerisation International, 2004b).

3.4 New governance relationships

Korean government's decision to expand container handling capacity has been matched by a significant set of changes in the liberalization of port handling operations. Most importantly, the Korean operators' monopoly on port operations, either by KCTA or the Korean carriers, has ended, and the entry of the largest world terminal operators has been encouraged (Lee, 1999). In February 2002, the Hong Kong terminal operating company Hutchinson Port Holdings entered the port, having purchased the Jasung Dae Terminal from Hyundai and is committed to the Phase II development of Gwangyang. In the New Busan Port, CSX World Terminals is the major private investor along with KCTA.

The liberalization was taken one step further in January 2004, when a new organization was created to administer the port of Busan. No longer directly dependent upon MOMAF, the new Busan Port Authority (BPA) is irresponsible for maritime operations and development. It must follow the same accounting principles as a private company. The goal is to create a more flexible administrative structure that can respond more quickly to the commercial needs of customers and

to external pressures and challenges than the former highly centralized system. It may be noted, however, that BPA is independent of the local government, although it is hoped that it will establish synergies with the local authorities in order more effectively coordinate port development with regional planning and economic development.

Together, these measures are intended to serve Korean territorial development in facilitating the growth of logistics and financial activities linked to maritime transport. In New Busan Port, as in Gwangyang, some areas are reserved for logistics activities, and the ports' free zone status is likely to attract investors. The new centres are intended to add value to transshipment activities and introduce new functions into the limited economic bases of the two port cities.

4. CONCLUSION

While Busan has been shaped by global forces, particularly the expansion of trade from the Pacific Rim, and is confronting competition from beyond Korea; this paper demonstrates that local factors play an important role in shaping its development and challenges. Congestion is a common feature of East Asian ports, where traffic growth is presenting particular problems of access and facility development. As in Singapore, Shanghai and Hong Kong expansion of infrastructure is taking place at a regional scale. The "challenge of peripheral ports" (Hayuth, 1981) is giving rise to new facilities development that may be under the jurisdiction of the local port authority, as is the case of Busan New Port in Busan and Yangshan in Shanghai, or in the development of terminals under different jurisdictions, as in the case of Gwangyang in South Korea, Tanjung Pelepas in the case of Singapore, and the Shenzhen ports in the Pearl River Delta. Just as Shenzhen ports are now challenging the hegemony of Hong Kong (Wang and Slack), so Gwangyang may be seen as a competitor to Busan. In the case of Taiwan, the dominant position

of Kaohsiung is still evident, although there have been attempts to establish new container terminals in Keelung (Haynes and al, 1998).

Busan offers many similarities with Kaohsiung, both in terms of competition for space within the port area and with the relatively specialized economic base of the local economies. Like Kaohsiung, Busan is primarily a centre of heavy manufacturing, and has failed to develop financial and other high order services that are typical of other major hubs such as Tokyo, Shanghai and Hong Kong. Whether this can be changed by fostering logistics activities is uncertain, particularly because of the dominance of the national capitals, Seoul and Taipei.

The most severe challenges faced by Busan are undoubtedly regional and international in scope. It has exploited the weaknesses of China's port infrastructures and of Japan's port management to establish an important transshipment function. In this regard, with 40% of its traffic being made up of transfers, Busan is in a more exposed position than any other of the Asian hub ports, except for Singapore. The massive investments in container handling facilities in many Chinese ports, and the involvement of many of the leading global terminal handling companies in their management, presents an enormous challenge to Busan. Whether or not its own internal port reforms and expansion will be sufficient to counter the developments in China remain to be seen.

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